

WHAT IS CLAIMED IS:

1. An optical source generator for wavelength-division-multiplexing optical communication systems, comprising:

5 a pumping-light generation section for generating and outputting pumping lights;

 a wavelength-division multiplexer/demultiplexer, provided with one multiplexing port and a plurality of demultiplexing ports, for wavelength-division-multiplexing and outputting optical signals inputted into the multiplexing port, and for
10 wavelength-division-demultiplexing and outputting optical signals inputted into the demultiplexing ports;

 an optical path converter for outputting the pumping lights generated and received from the pumping-light generation section to the multiplexing port of the wavelength-division multiplexer/demultiplexer by converting a path of the pumping
15 lights, and for outputting optical signals outputted from the multiplexing port of the wavelength-division multiplexer/demultiplexer through converted paths for the optical signals;

 a plurality of wavelength-dependent reflectors, each connected to one of the respective demultiplexing ports of the wavelength-division multiplexer/demultiplexer,
20 for reflecting only optical signals that have a particular wavelength that corresponds to one of the respective said demultiplexing ports;

 a plurality of optical fiber amplifiers, each having two sides one side of which is connected to one of the associated wavelength-dependent reflectors, for generating spontaneously emitted lights in response to pumping lights generated from the

pumping-light generation section; and,

a plurality of wavelength-independent reflectors, each connected to the other side of one of the respective optical fiber amplifiers, for reflecting all optical signals including said optical signals that have a particular wavelength.

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2. The optical source generator according to claim 1, wherein each reflectance of the wavelength-dependent reflectors and each reflectance of the wavelength-independent reflectors are controlled independently, thereby enabling optical sources to be transmitted through the respective reflectors unilaterally or bilaterally.

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3. The optical source generator according to claim 1, wherein the wavelength-dependent reflectors comprise fiber-Bragg gratings which are each connected respectively to the demultiplexing ports of the wavelength-division multiplexer/demultiplexer.

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4. The optical source generator according to claim 1, wherein the wavelength-dependent reflectors comprise thin film-filter reflectors which are each connected respectively to the demultiplexing ports of the wavelength-division multiplexer/demultiplexer and have respective thin film filters.

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5. The optical source generator according to claim 1, wherein the optical path converter includes an optical circulator comprising:

a first port for inputting pumping lights generated from the pumping-light generation section;

5 a second port connected to the multiplexing port of the wavelength-division multiplexer/demultiplexer; and,

a third port for outputting the wavelength-division-multiplexed optical signals.

6. The optical source generator according to claim 1, further comprising a
10 plurality of modulators for using wavelength-division-multiplexed lights passing through the wavelength-independent reflectors as individual optical sources.

7. An optical source generator for wavelength-division-multiplexing optical communication systems, comprising:

15 a wavelength-division multiplexer/demultiplexer, provided with one multiplexing port and a plurality of demultiplexing ports, for wavelength-division-multiplexing and outputting optical signals inputted into the multiplexing port, and for wavelength-division-demultiplexing and outputting optical signals inputted into the demultiplexing ports;

20 a pumping-light generation section for generating and outputting pumping lights;

an optical path converter having a first port for inputting pumping lights generated from the pumping-light generation section, a second port connected to the multiplexing port of the wavelength-division multiplexer/demultiplexer, and a third port

for outputting the wavelength-division-multiplexed optical signals;

a plurality of wavelength-dependent reflectors, each connected to one of the respective demultiplexing ports of the wavelength-division multiplexer/demultiplexer, for reflecting only optical signals that have a particular wavelength that corresponds to one of the respective said demultiplexing ports;

a plurality of optical fiber amplifiers, each having two sides one side of which is connected to one of the associated wavelength-dependent reflectors, for generating spontaneously emitted lights in response to pumping lights generated from the pumping-light generation section;

a first plurality of wavelength-independent reflectors, each connected to the other side of one of the respective optical fiber amplifiers, for reflecting all optical signals including said optical signals that have a particular wavelength;

an optical band pass filter, having two sides one of which is connected to the third port of the optical path converter, for passing through only the optical source bands; and,

a second plurality of wavelength-independent reflectors, each connected to the other side of the optical band pass filter, for reflecting all optical signals including said optical signals that have a particular wavelength.

8. The optical source generator according to claim 1, wherein each reflectance of the first and second wavelength-independent reflectors is controlled independently, thereby enabling the optical sources to be transmitted through the respective reflectors unilaterally or bilaterally.